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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/724,891	12/02/2003	Chung-Ju Wu	82547	2424
20529	7590	02/28/2006		
NATH & ASSOCIATES 112 South West Street Alexandria, VA 22314			EXAMINER VORTMAN, ANATOLY	
			ART UNIT 2835	PAPER NUMBER

DATE MAILED: 02/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

ETC

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/724,891	WU ET AL.	
	Examiner	Art Unit	
	Anatoly Vortman	2835	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 January 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5 and 7-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-3 and 7-9 is/are allowed.
- 6) ☒ Claim(s) 4, 5 and 10-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Amendment*

1. The submission of the amendment filed on January 5, 2006 is acknowledged. The Office action follows:

### *Specification*

2. 35 U.S.C. 112, first paragraph, requires the specification to be written in "full, clear, concise, and exact terms." The specification is replete with terms which are not clear, concise and exact. The amendment to the specification did not cure all of the deficiencies as was indicated in the first Office action and also had introduced new problems. The specification should be revised carefully in order to comply with 35 U.S.C. 112, first paragraph. Examples of some unclear, inexact or verbose terms used in the specification are: "However, there are many types of electronic device that need cooling" (p.3, lines 1 and 2); "or plant to the electronic device" (p. 3, line 5); "at least two conductive pillars 6 on the backside of the first heat dissipating element 2 that takes place the conventional plastic pillars" (p. 9, lines 21 and 22); "many types of electronic device" (amendment, p. 3, line 7); "In addition, the second the heat sink assembly is a bottom plate" (amendment, p. 5, last two lines); "the heat is generated die or chip that can be removed by the dissipation..." (amendment, p. 6, lines 1-8); "tape spread overall the surface of backside of the heat sink body to fix (?) and to increase the heat dissipating

Art Unit: 2835

efficiency” (emphasis added) (amendment, p. 6, last two lines); “view that shows the heat dissipating is introduced” (amendment, p. 8, lines 2 and 3); “Fig. 3 through Fig. 7 shows” (amendment, p. 8, line 9); “heat is generated during operating integrated circuit” (amendment, p. 9, line 5 from the bottom of the page); “to introduce the heat conductivity” (amendment, p. 9, last line); “located on the backside of the first heat dissipating structure 2 or added on the backside of the first heat-dissipating structure 2” (amendment, p. 10, lines 9 and 10); “the conductive protruding block 8 can assemble with the cavity” (amendment, p. 11, lines 5 and 6); “structure 32 of the central of the bottom plate” (amendment, p. 11, last two lines and p. 12, line 5); “supports 6 does not contact” and “the hole-wall of the holes” (amendment, p. 12, last 2 lines); “material 42 is filled with the gap space” (amendment, p. 13, line 4); “The key feature of the embodiment, the bottom plate 1B is made of the conductive material” (amendment, p. 13, line 3 from the bottom); “to pull tight between” (amendment, p. 14, line 2); “during the computer is operated” (p. 14, lines 6 and 7); and, “the second the heat sink assembly” (amendment, p. 15, line 5 from the bottom).

Also, the entire passages on p. 14 of the amendment, lines 8+, describing the first and second paths are so cumbersome and idiomatically incorrect that it is hard to understand what the Applicant is trying to convey.

The Examiner would like to reiterate, that aforementioned are **only the examples**. The specification **replete with grammatical and idiomatic errors**. There are numerous similar problems throughout the original and amended specifications.

The Applicant is again advised to carefully review the entire specification and the abstract in order to correct the deficiencies as stated above.

A substitute specification in proper idiomatic English and in compliance with 37 CFR 1.52(a) and (b) is highly recommended. The substitute specification filed must be accompanied by a statement that it contains no new matter.

### *Claim Objections*

3. All pending claims are objected to because of the following informalities: claims recite the limitation “conductive” on numerous occasions. However it is not clear what kind of conduction is meant by Applicant (i.e. electrical, thermal, etc). Clarification is required.

### *Claim Rejections - 35 USC § 112*

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 4, 5, and 10-20, are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 4, claim recites: “a conductive protruding block on the backside of said first heat dissipating structure”. The recitation is open-ended, unclear and creates indefiniteness (i.e. said block should be located or disposed on the backside, etc.).

Regarding claim 5, claim recites: “said backside of said first heat dissipating structure”. There is no antecedent basis for “said backside”.

Regarding claims 10-15, claim 10 recites: “package device having a cavity of an embedded heat slug therein”. This is indefinite. The embedded heat slug is having a cavity, not the package device as claimed.

Regarding claims 16-20, claims 16 and 17 recite: “said first heat dissipating structure”, which lacks antecedent basis and claim 19 recites an incomprehensible phrase: “a conductive material full (?) with at least said two through holes...” (emphasis added) which also renders claim indefinite.

The Applicant is advised to carefully review all pending claims in order to correct the aforementioned deficiencies and also similar deficiencies not mentioned above.

### ***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 16-20, **as best understood**, are rejected under 35 U.S.C. 102(b) as being anticipated by US/6154365 to Pollard, II et al. (Pollard).

Regarding claim 16, Pollard disclosed (Fig. 2, 3) a heat sink device of a package device (34), comprising: a first heat sink assembly (42) with a conducting protruding block (any of the sticking-out portions of structure (47)), a second heat dissipating structure (43) on a first heat dissipating structure (47), and at least two conductive supports (56) located below said first heat

dissipating structure (47); a printed circuit board (36) having a package device (34) thereon, and having at least two holes (41) thereon; and a second heat sink assembly (44), having a protruding structure (46) in the center and the at least two through holes (55) on the two sides of said second heat sink assembly (44), wherein said first heat sink assembly (42) has at least said two conductive supports (56) that passed through at least said two through holes (41) of said printed circuit board (36), and joined with said two through holes (55) on said two sides of said second heat sink assembly (44).

Regarding the product-by-process claim 17, the method step of making (casting) of the device is not limiting of the structure. The method of forming the device is not germane to the issue of patentability of the device itself. Even though the claims are limited by and defined by the recited process (casting), the determination of patentability of the product is based on the product itself, and does not depend on its method of production. If the product in the product-by-process claims are the same as or obvious from a product of the prior art, the claims are unpatentable even though the prior product was made by a different process. *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985). Therefore, the claim had not been given patentable weight.

Regarding claim 18, Pollard disclosed that said second heat dissipating structure (43) is a heat dissipating fin (Fig. 2, 3).

Regarding claim 19, Pollard disclosed (Fig. 2, 3) a conductive material (58) filling said two holes (55), whereby said two holes (55) connected with said two conductive supports (56).

Regarding claim 20, Pollard disclosed (Fig. 2, 3) at least two springs (52, 54) that put around said two conducting supports (56).

***Allowable Subject Matter***

8. Claims 1-3 and 7-9 are allowed. Claims 4 and 5 would be allowed upon correction of 35 USC 112, paragraph 2, problems. Claim 1 is allowed, because it now contains limitations of claim 6, previously indicated as having allowable subject matter (see paragraph 9 of the non-final Office action mailed on October 5, 2005).

Claims 10-15 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

The allowability of claims 10-15 resides in the overall structure of the device as recited in independent claim 10, and at least in part, because claim recites: "a conductive protruding block embedded in said cavity...is contacted with said backside of said first heat dissipating structure".

***Response to Arguments***

9. Regarding claim 16, the Applicant contends that Pollard '365 does not teach "said ball grid array package device having an embedded heat slug with a cavity thereon". This is not persuasive, since claim 16 does not contain such language. Further, the Applicant contends that Pollard '365 does not teach "a first heat sink assembly with a conductive protruding block,...". The Examiner would like to reiterate that any sticking-out portion of the structure (47) is a conductive protruding block. The remaining arguments are moot due to the allowance of the claims.

***Conclusion***

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anatoly Vortman whose telephone number is 571-272-2047. The examiner can normally be reached on Monday-Friday, between 10:00 am and 6:30 pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ms. Lynn Feild can be reached on 571-272-2092. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>.

Art Unit: 2835

Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AV

A handwritten signature in black ink, appearing to read 'A. Vortman', followed by a horizontal line.

Anatoly Vortman  
Primary Examiner  
Art Unit 2835